Presentation to the Clean Coal Study Group Public Service Commission of Wisconsin

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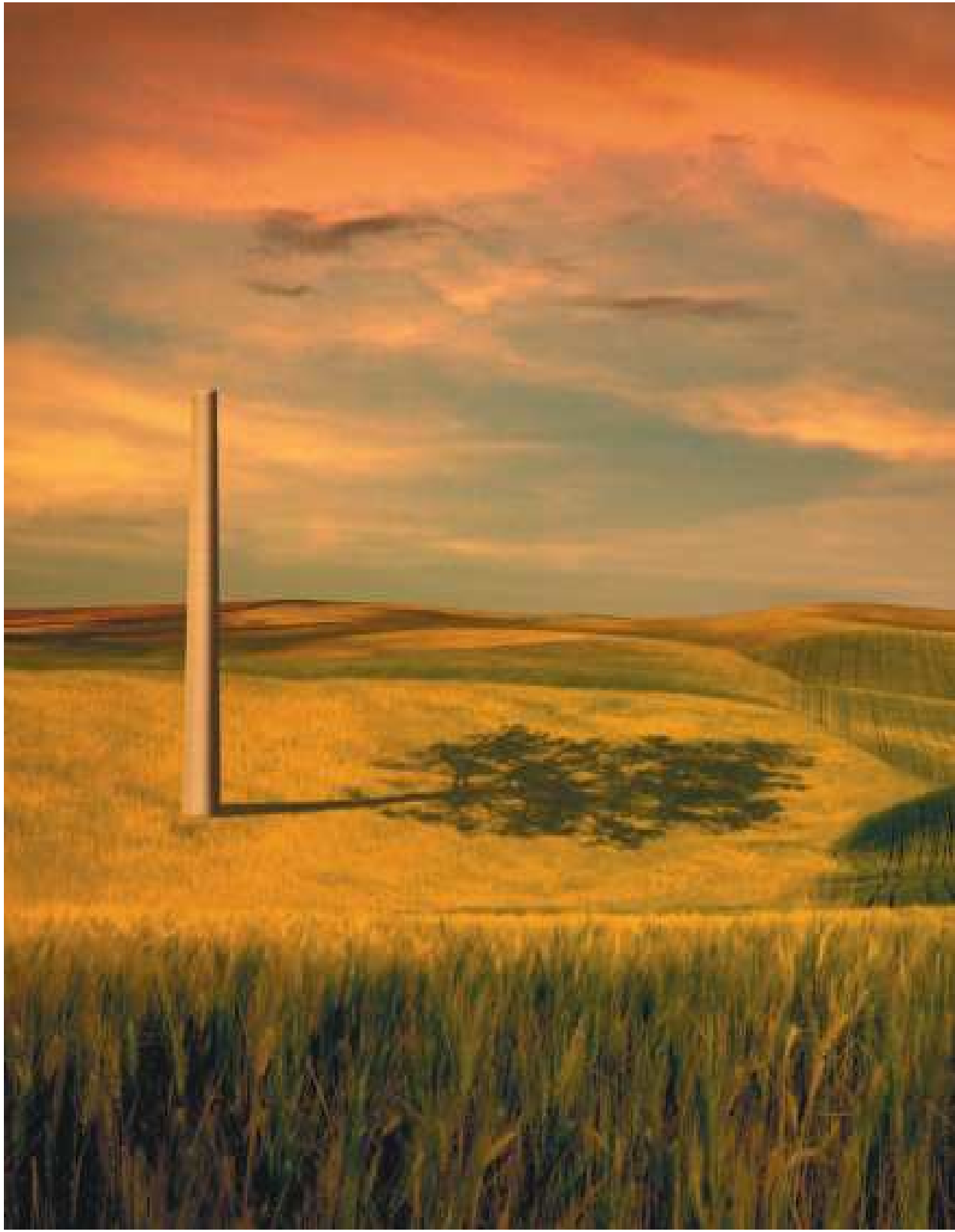

Today's Topics

- Commercial Status
- Engineering
- Cost
- Environmental
- Siting
- Economic Development
- Policy

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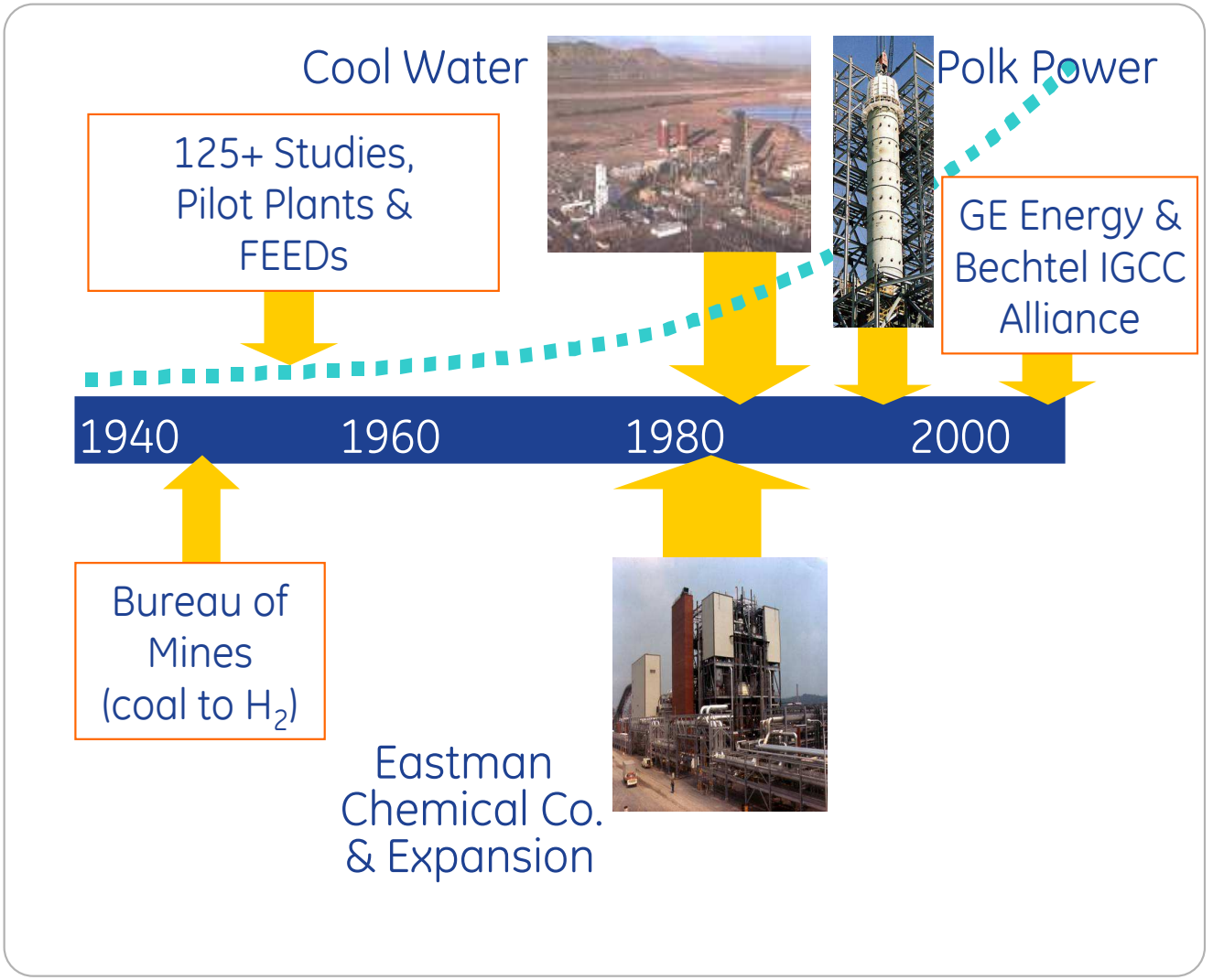
Bechtel IGCC Leadership

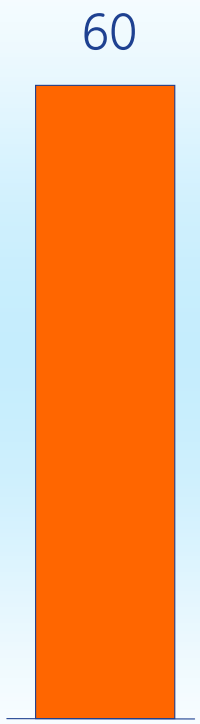
- Industry leader in IGCC, gas turbine combined cycle plants & large coal plants
- Seamless contractor capability… from project development through projection completion
- Certainty of outcome

More than 50 years in gasification



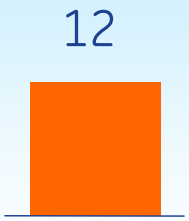
GE IGCC Leadership

Gasification Experience



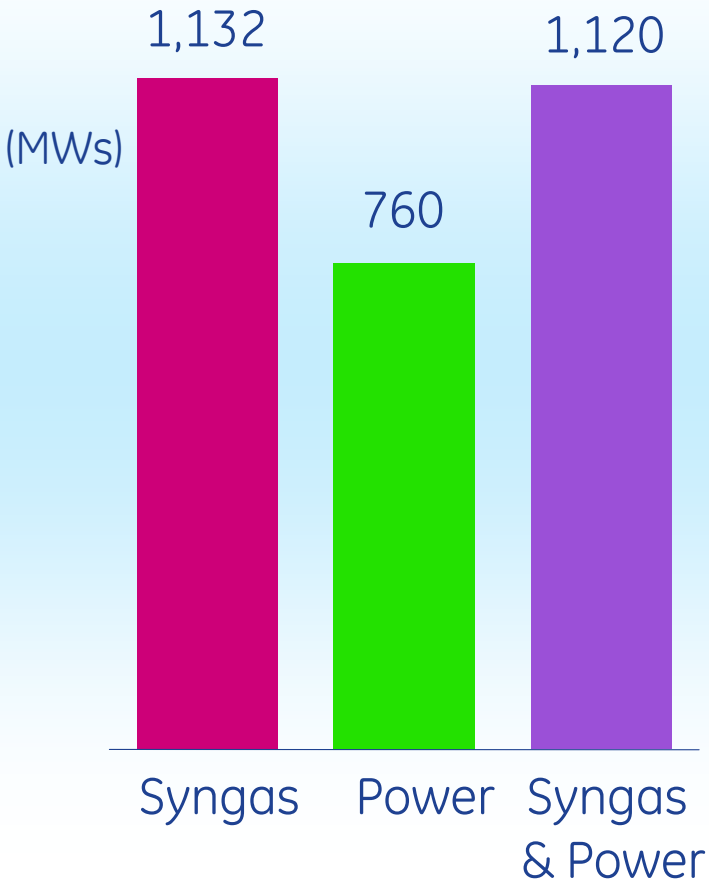
Gasification Plants

Solid Fuels Only



Gasification Plants

>3 GW GE IGCC Experience



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A Compelling Commercial Solution for IGCC

Previous IGCC 'Gap'

- CAPEX too high (+20–25%)
- COE too high (+10%)
- Poor Initial RAM
- No system guarantees or warrantees – only license
- Higher owner execution risks
- No single point solution

GE & Bechtel's IGCC Alliance

- IGCC reference plant w/lower CAPEX & improved performance
- Combines & leverages core competencies & experience
- Ownership of key technologies
- Turnkey IGCC offering
- Single point responsibility for firm price, schedule, performance & emissions guarantees

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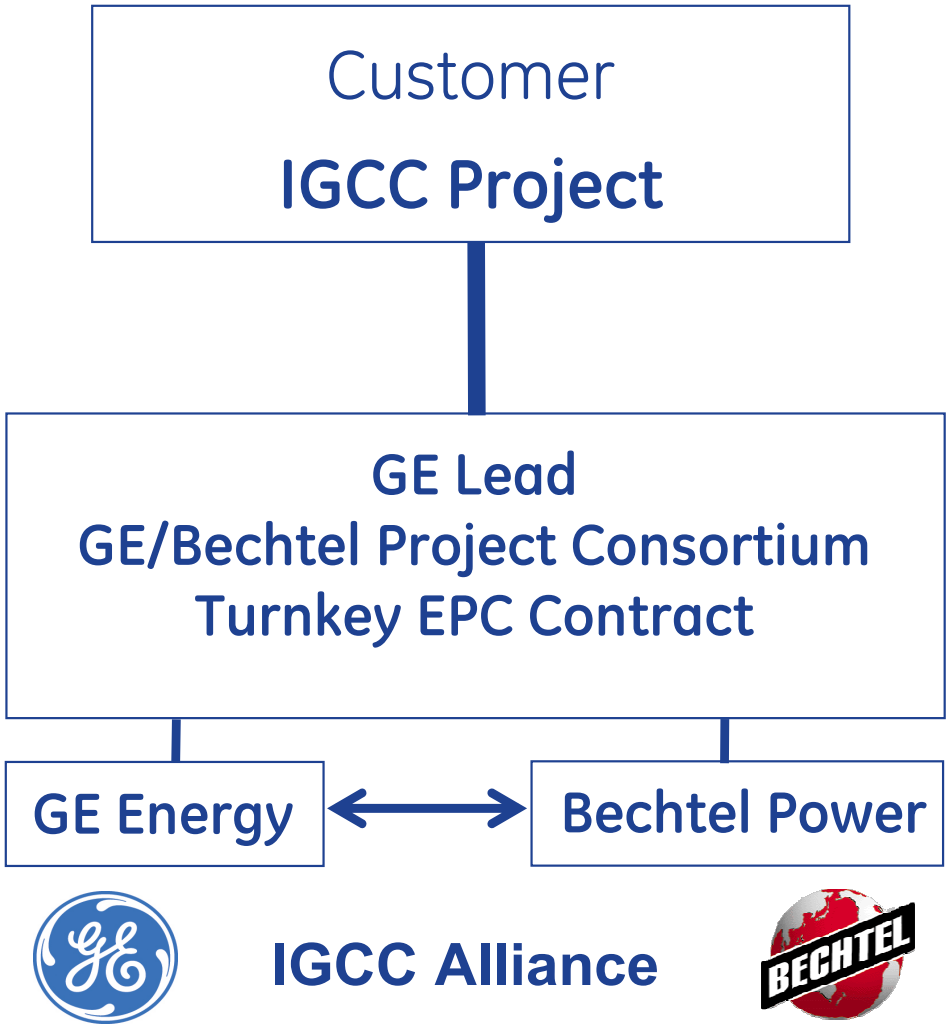
IGCC Commercial Status

True Single Point Responsibility



Contract Scope

- EPC Firm Price w/ Guaranteed:
- Schedule
- Output
- Heat Rate
- Air Emissions

Facilitates Project Financing

IGCC Launch Plant Status

Site – Meigs County, Ohio

Site – Edwardsport, IN

AEP IGCC Project

- 2Q05 completed IGCC feasibility study (GE & Bechtel reference plant)
- 9/29 announced FEED study with AEP
- 3Q06 FEED will be complete
- 2010 expected commercial start up

Cinergy IGCC Project

- 2Q05 completed IGCC feasibility study (GE & Bechtel reference plant)
- 9/22 Cinergy announced it would begin contract negotiations with GE & Bechtel for FEED

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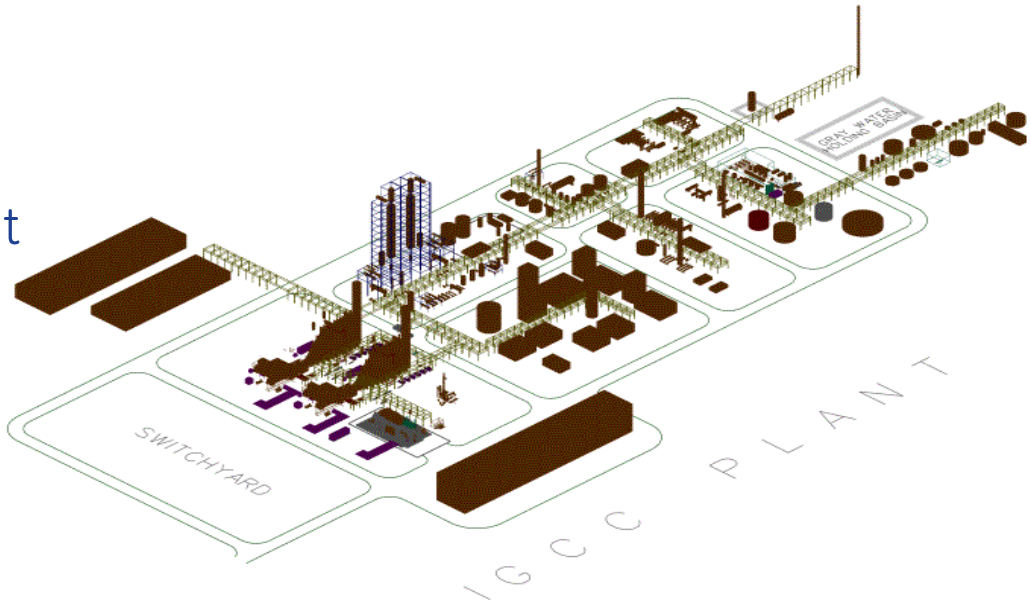
IGCC Reference Plant

Reference Plant Performance

- Nominal 630MW net plant output
- Base load/Load following operation
- Turndown to ~50% load (2 gasif. opr.)
- Fuel flexibility
  - Wide range of bituminous coals
  - Coal/coke blends
- Nominal 4% sulfur, 14% ash
- 5ppmv NOx w/SCR, 15 ppmv CT
- Availability target ~85% on syngas
- Cost target: +10% to PC launch, parity at maturity
- Natural gas or distillate backup fuel
- Allows for future CO_2 capture block

Reference Plant Options

- Coal/coke blending
- Zero liquid discharge
- Spare gasifier train
- Higher sulfur/Cl feedstock



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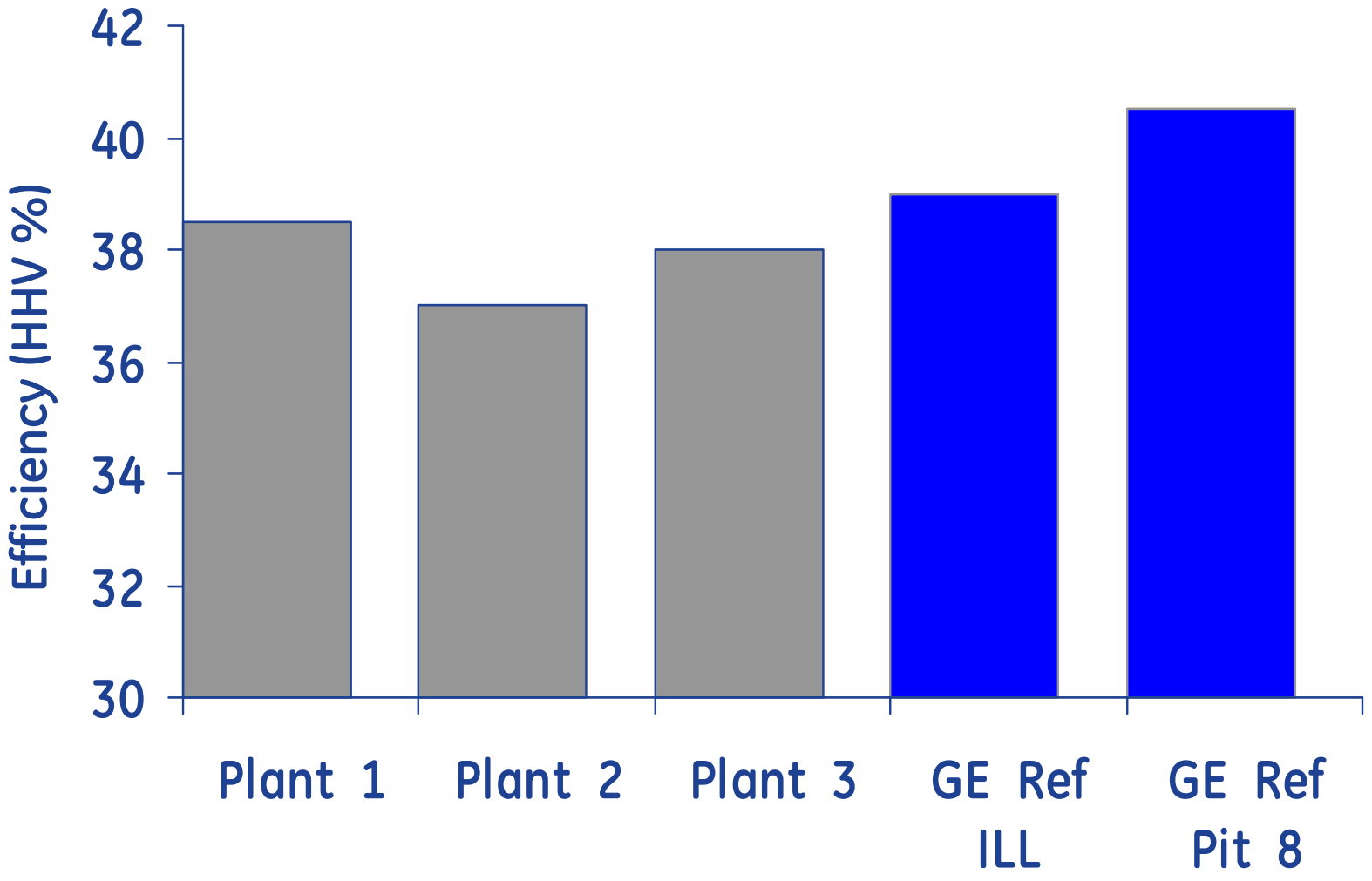
Comparative Performance



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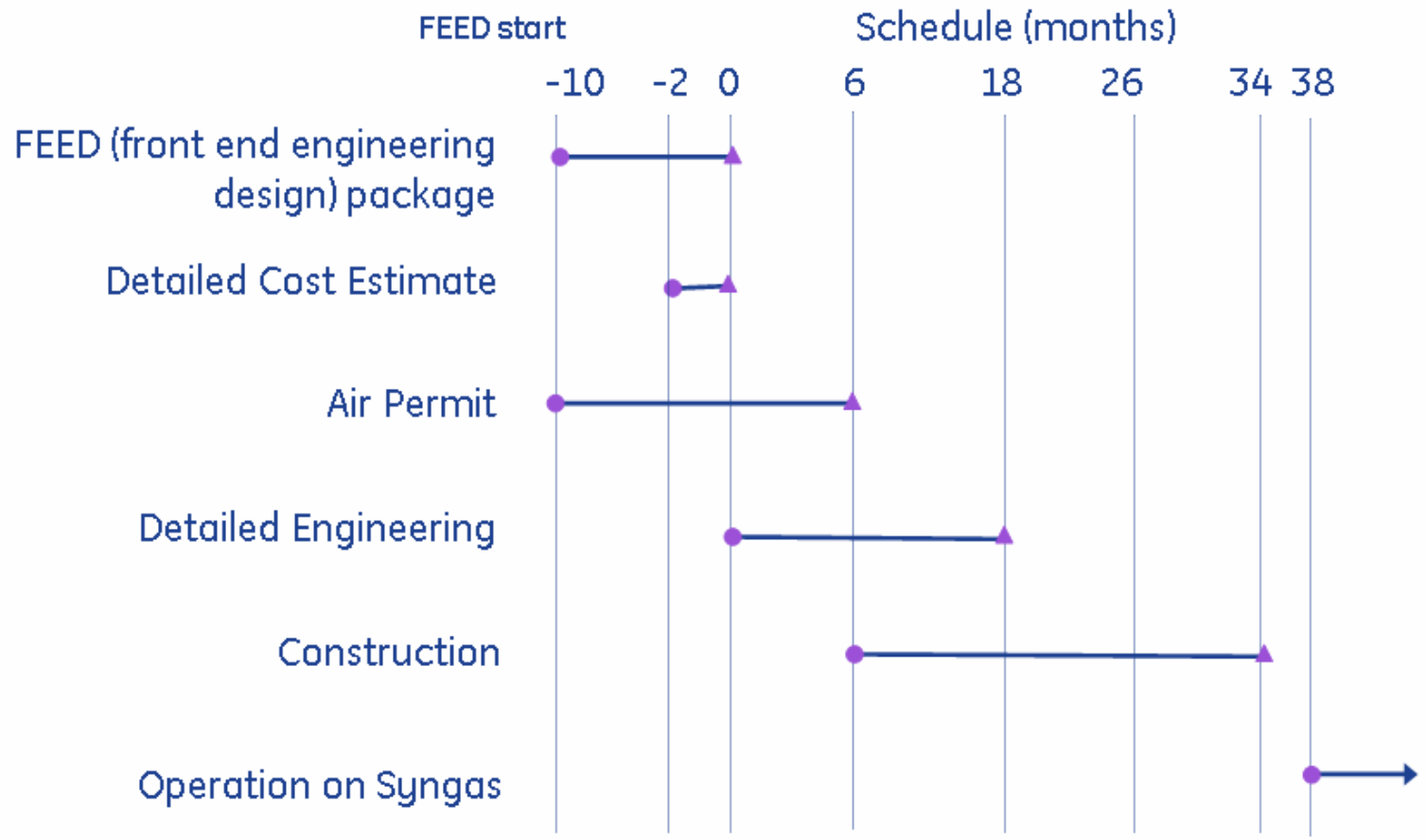
EPC schedules for IGCC and PC (600 MW)



PC plant schedule is typically:

- shorter from inception to Notice-to-Proceed (month 0)
- similar time from NTP to Commercial Operation

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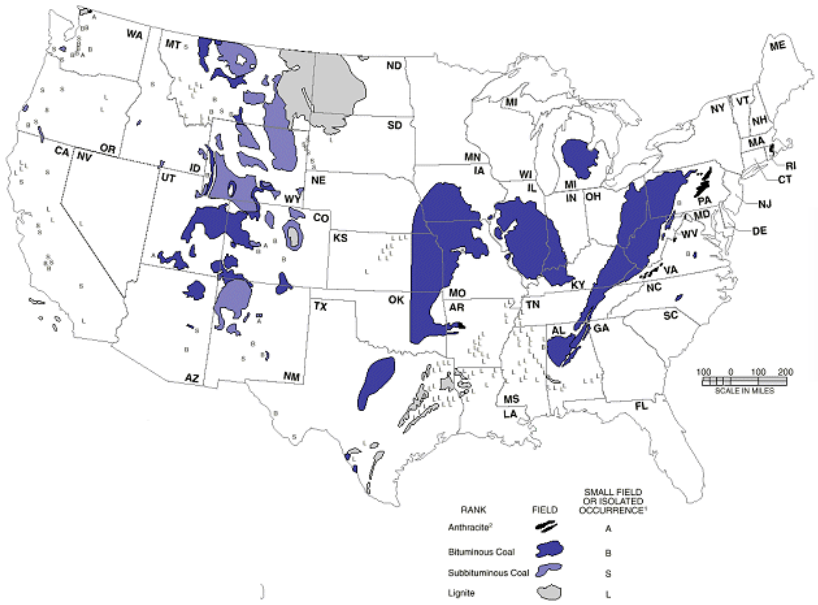
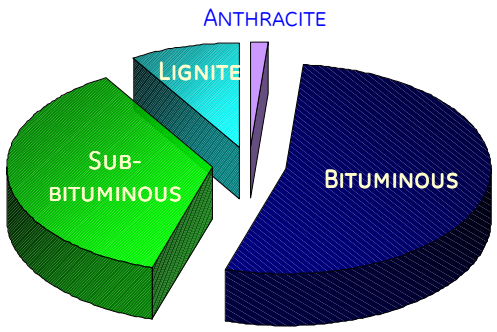
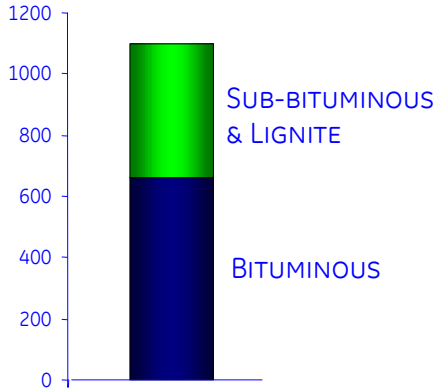
Coal Type Effect on Operations



US Demonstrated Mineable Coal Reserve Base



US Coal Production MM Tons/yr



37% of reserves

41% of production

- Impacts both PC and IGCC cost and performance
- Key parameters are Mercury and moisture
- IGCC for low-rank coals needs FOKE

	Parameter	PC	Current IGCC	Low Rank Coal IGCC
Mercury Control	% capture	50%-80%	90%+	90%+
	COE			
Ash	Heat Rate			
	CAPEX:			
Inherent Moisture	Heat Rate			
	CAPEX:			

Impact Key	Low (0%-5%)	Moderate (5%-10%	Significant (10%-20%)

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Operating Feedstock Flexibility

- Broad range of bituminous coals
- Expanded fuel envelope option for
  - -- Higher sulfur capability
  - -- Higher chlorides
- Designed for low-cost, pet-coke blends
  - -- 30% blend with no modification
  - -- Up to 70% blend with minimal modification

Key **Reference Plant** Coal Properties:

- Sulfur → 0.74-4%
- Ash → up to 14%
- Chlorides → up to 2,500 ppm

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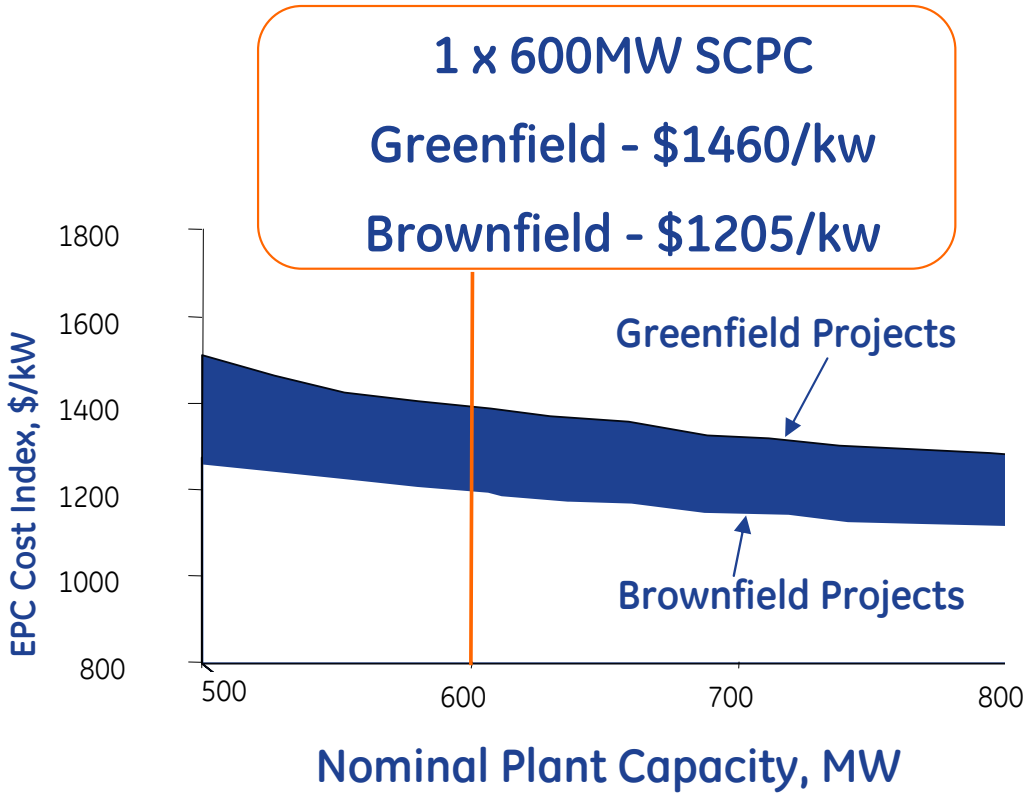
IGCC & SCPC…Benchmarking Capital Cost

- IGCC alliance benchmarked SCPC price for Ohio River Valley 1st Qtr 2005
- Greenfield 600 MW SCPC ~1400 to 1460 $/kw ORV
- IGCC/SCPC Brownfield savings vary ~150 to 250 $/kw
- IGCC premium has been ~ 20-25%



1st Quarter 2005 – Ohio River Valley Cost Estimate Basis

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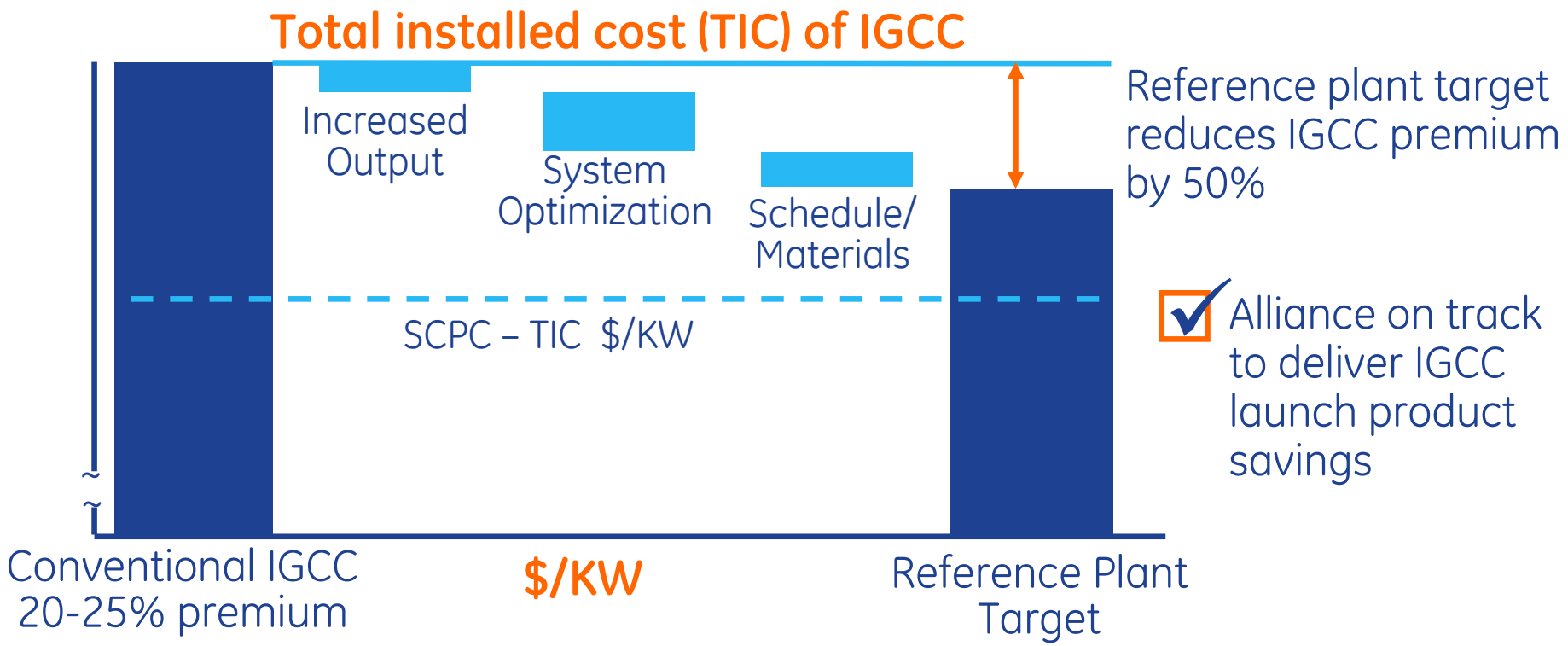
IGCC Reference Plant Reduces Capital Cost

- Launch target to cut IGCC CAPEX premium by 50%
- Optimizing power generation and gasification integration
- Incorporating lessons for operability and lower cost
- Establishing supply chain relationships



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US Energy Policy Act of 2005

Significant incentives for gasification

- IGCC 20% ITC, up to $800 MM in credits
- 80% Federal loan guarantees, advanced technology projects
- "Clean Coal Power Initiative", $1.8B FY 2006-2014
- "Clean Power Projects", many specific applications identified

Energy Policy Act goal is to accelerate the widespread application of gasification technologies...especially IGCC

Financing and Ownership Options

- Financing of IGCC has the same options as other power plant technologies:
  - Rate base
  - On-balance sheet
  - Off-balance sheet, non-recourse
- Less financing experience with IGCC, but lenders say they have the capital for good IGCC projects with strong players
- Lenders look to owner and/or contractor to take cost, schedule, and performance risks.
- Difficult to project finance without off-take agreements (merchant)

Economic Effects of the Wholesale Market

- The electric wholesale market should not affect the cost of IGCC projects
- It further reinforces the need to:
  - drive down capital cost
  - design for fuel flexibility and low cost fuels
  - reduce cost of dispatch (fuel and variable O&M)
  - provide turndown capability

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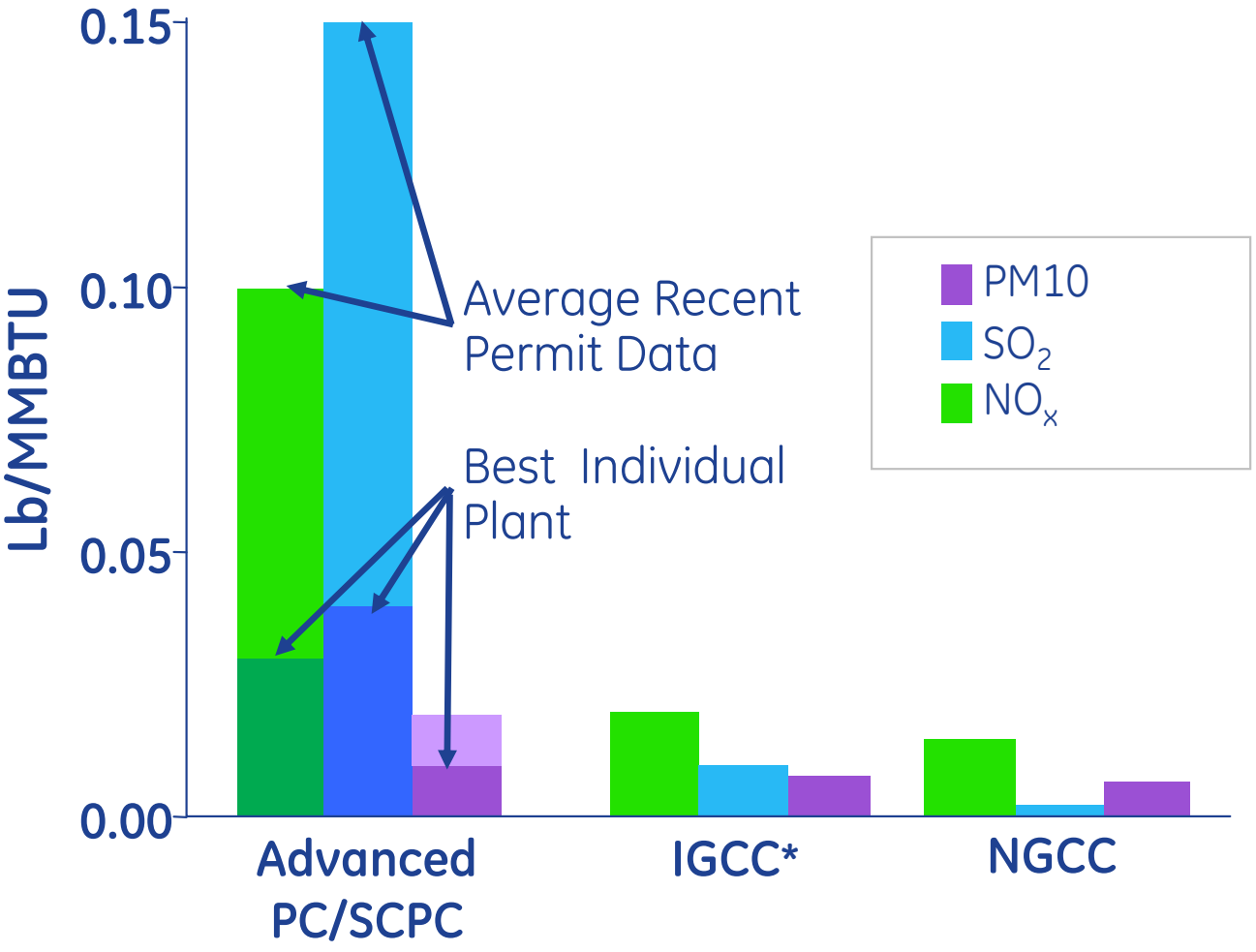
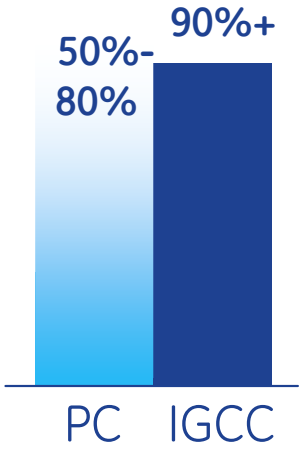
IGCC Operation – Criteria Emissions



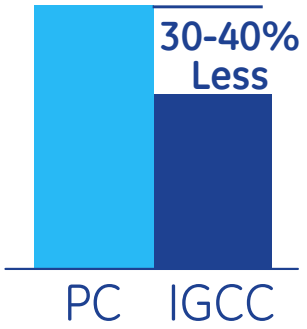
Source: GE internal data, average of 28 permits granted, applications and publicly reported emissions

* Continuous emissions

Hg % Captured



Hg



Water Consumption

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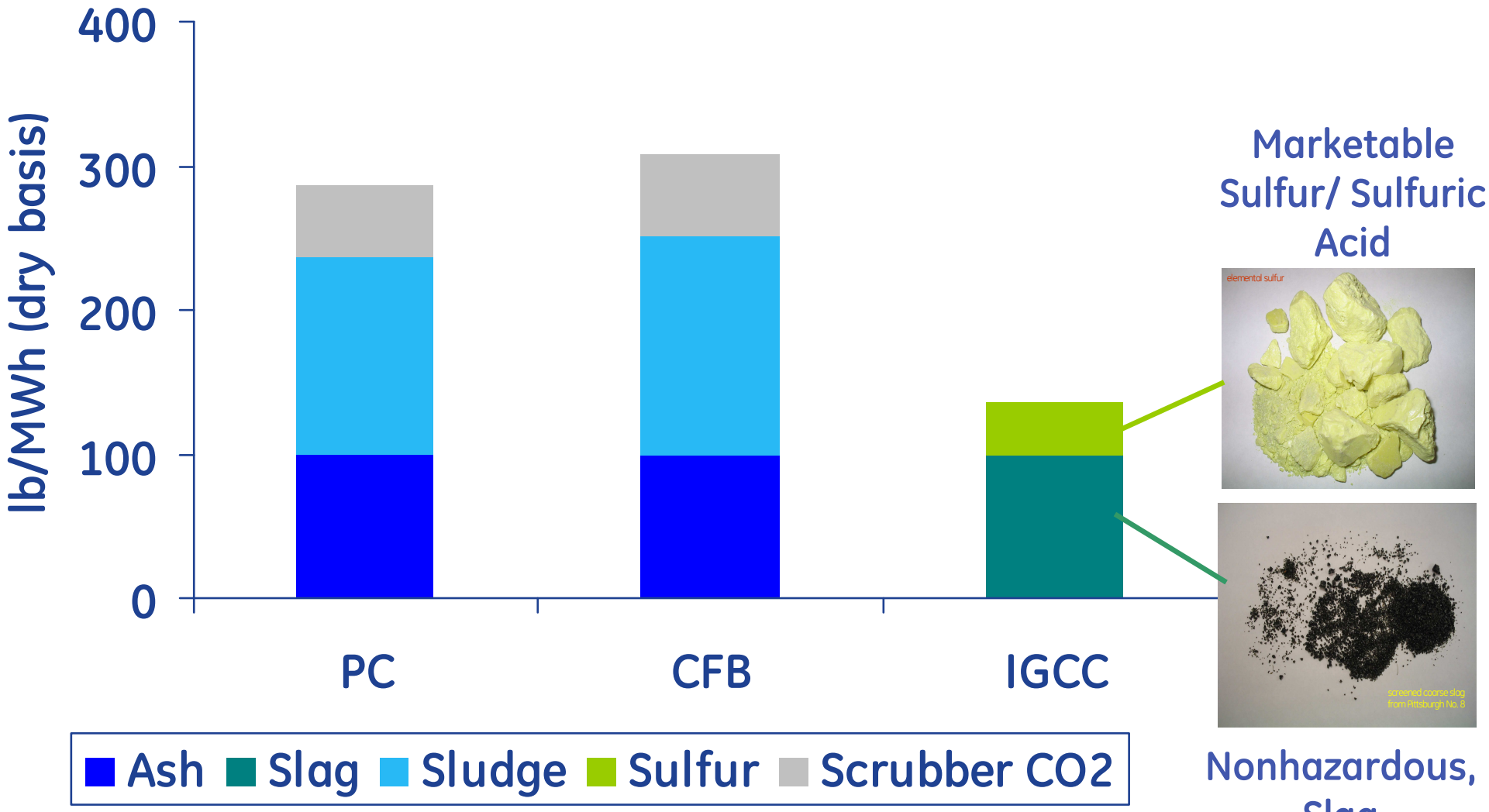
Environmental – Waste & Byproduct



Marketable Sulfur/ Sulfuric Acid

Nonhazardous, Slag

Basis: Illinois #6 coal, dry waste

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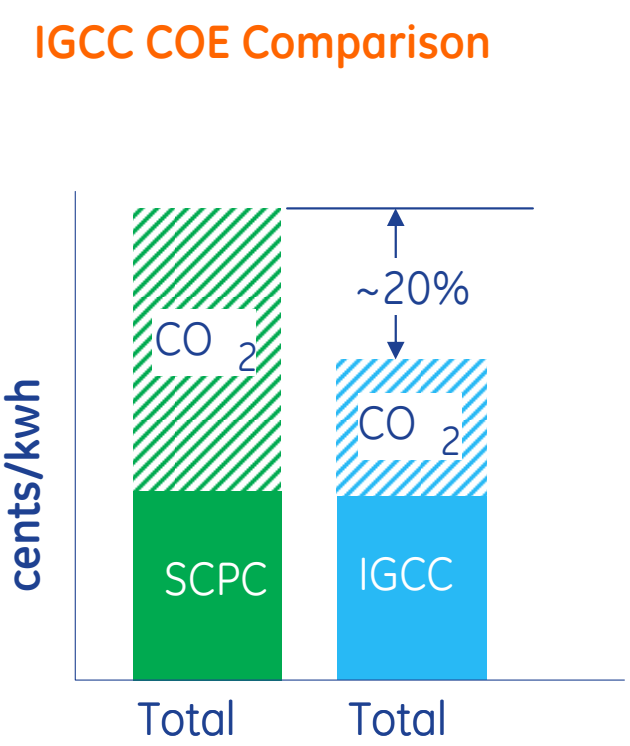
Cost of CO_2 Capture



IGCC offers significant COE benefits for future capture of CO_2

Effects of Wisconsin Climate on Operation

- Cold weather requires certain winterization design features such as:
  - additional insulation to protect water and instrument lines from freezing
  - a few more enclosures to facilitate operations and maintenance
  - Will require inlet bleed heat for GT operation
- Plant is “flat rated” so net power output and efficiency are fairly constant across ambient temperature range
- Gasification and similar plants operate in cold climates such as other northern states and in Canada

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Is Wisconsin a suitable host for IGCC?

- Wisconsin has the needed labor force and craft skills for a large IGCC project
- Each site must be evaluated on its own merits in terms of geology, layout, infrastructure, etc.
- Coal – multiple potential sources and delivery infrastructure already available
- Existing acceptance of coal as a power generation option

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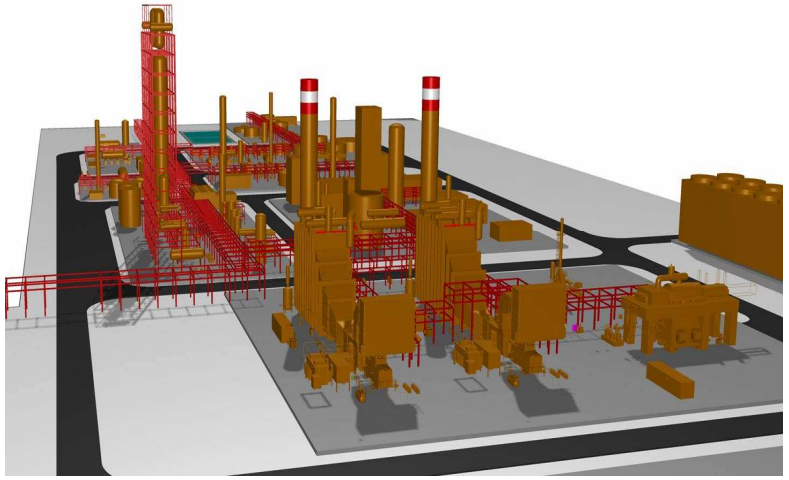
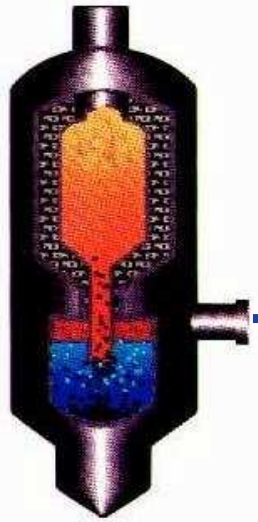
Jobs and Materials Sourcing

- A 630 MW IGCC project will brings jobs to the state:
  - Peak construction labor force of about 1600
  - 3.5 million total labor hours.
  - Permanent operating staff of about 140 plus contract maintenance force



Deriving Maximum Value From Coal



$(H_2 + CO)$
Syngas

- **Electricity (IGCC)**
  - Greenfield
  - Polygen
  - Refueling
  - Site Repowering
- **Coal to Liquids**
  - Clean Diesel
  - Methanol, DME, Gasoline, Kerosene, Naphtha, Heavy oil
- **Refineries**
  - Hydrotreating
  - Hydrocracking
  - Hydrodesulfurization
  - Hydrodenitrogenation
- **Chemicals**
  - Methanol
    - Formaldehyde
    - MTBE
    - Acetic acid
    - Amine
    - DME
  - Ammonia
    - Urea
    - Ammonia nitrate/sulfate
  - Oxochemicals: Butanol, Ethylhexanol

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Key State IGCC Incentives

Illinois State Incentives

Illinois Coal Competitiveness Program – Launched FY1997

- Leverage private investment in coal production, transportation and utilization
- 20% cost share, projects selected on economic criteria
- OCD managed, first grants issued in Fall 2004

Illinois Coal Demonstration Program

- $183 million bond authorization to demonstrate and deploy clean coal technologies
- Provides up to 20% cost share, may go higher
- Requires project specific applications, hence long lead time

Illinois Coal Revival Program

- Created by the Resource Development and Energy Security Act
- $500 million bond authorization for financial assistance (grants) to new generation projects
- Qualifying facilities must generate 400MW and create 150 jobs

Key State IGCC Initiatives

Indiana State Incentives

IC 6 3.1-29 Coal Gasification Technology Investment Tax Credit

- Ten percent (10%) of the taxpayer's qualified investment for the first five hundred million dollars ($500,000,000) invested
- Five percent (5%) of the amount of the taxpayer's qualified investment that exceeds five hundred million dollars ($500,000,000)

IC 8-1-8.8 Utility Generation and Clean Coal Technology

- Timely recovery of costs incurred during construction and operation
- Authorization of up to three percentage points on the return on shareholder equity
- Financial Incentives for the purchase of fuels produced by coal gasification facility
- Other appropriate financial incentives

Why IGCC Makes Sense

- Proven technology - commercial operation today
- Fuel flexibility – lower cost fuels
- Better emissions performance – current & future
- High efficiency
- Targeting 50% reduction in CAPEX premium launch; CAPEX parity mature
- Energy security – domestic coal supplies
- Public acceptance – competitive cleaner coal alternative

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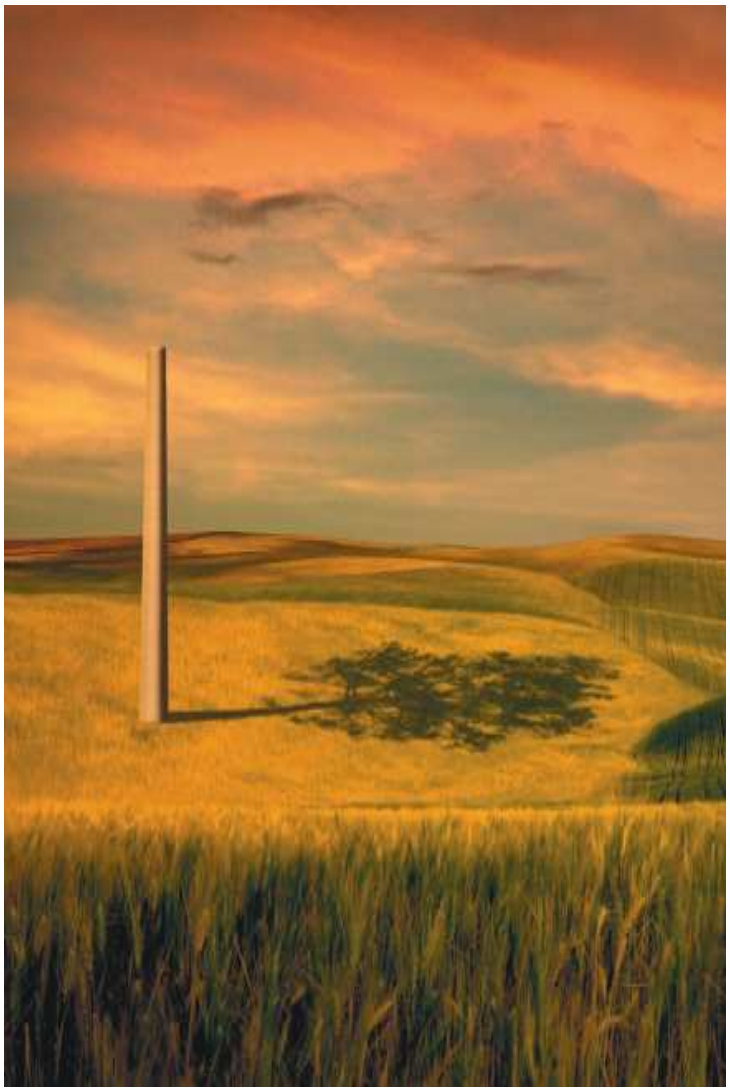
Q&A



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